



RCRA RECORDS CENTER
FACILITY MACDERMID, Inc.
I.D. NO. CTD001164599
FILE LOC. R-13
OTHER # 5982

Loureiro Engineering Associates, Inc.

February 14, 2005

United States Environmental Protection Agency, Region I

1 Congress Street
Suite 1100
Mail Code HBT
Boston, Massachusetts 02114-2023

Attn: Ms. Carolyn Casey

**RE: Environmental Indicator Determination Report Human Exposures (CA725)
MacDermid, Inc.
526 Huntingdon Avenue, Waterbury, Connecticut
LEA Comm. No. 91MH402**

Dear Ms. Casey,

On behalf of MacDermid, Inc., Loureiro Engineering Associates, Inc. (LEA) has prepared this letter and associated attachments to address your November 4, 2004, comment letter pertaining to the revised *Documentation of Environmental Indicator (EI) Determination, Current Human Exposures Under Control for the MacDermid, Inc. Waterbury, CT. Facility*, prepared by LEA and dated August 2004, for the MacDermid, Inc. (MacDermid) facility located at 526 Huntingdon Avenue (the Site).

In the attached comment response letter, comments made by the United States Environmental Protection Agency (EPA) are presented in italics, followed by MacDermid's responses.

Sincerely,

LOUREIRO ENGINEERING ASSOCIATES, INC.

Brian A. Cutler, P.E., L.E.P.
Senior Vice President

Enclosures

cc Mr. Richard Nave, MacDermid, Inc.

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RESPONSE TO COMMENTS

GENERAL COMMENTS

1. *In previous comments, it was requested that MacDermid install off-site monitoring wells in the vicinity of the residential area west of the site. Instead, the facility chose to install two nested well pairs along the western border of the site (Gear Street), in order to "provide a more refined understanding of groundwater flow direction and contaminant concentrations...." Based on the most recent round of groundwater level measurements, collected in August 2004, groundwater appears to be flowing in a southerly direction, parallel to the site's western boundary. There is not indication based on the reported groundwater flow that contaminated groundwater flows directly under adjacent residential properties (west of the site). However, all depth to groundwater information presented in the Environmental Indicator (EI) documentation has not been collected during late summer/early fall. Seasonal variations have not been taken into account, and groundwater flow direction and contaminant concentrations could vary throughout the year. Also, additional groundwater sampling and analysis should be conducted to evaluate potential seasonal variations in contaminant concentrations.*

At a minimum, one week notice must be provided to EPA prior to the start of any field work.

Once a commitment to conduct this additional monitoring is made, a schedule to complete this monitoring submitted, and the following comments adequately addressed, the EC can be signed off as a "YE" determination. The additional monitoring data will be reviewed as it is collected and submitted to the EPA to ensure that the "YE" determination remains appropriate for the site.

A *Groundwater Monitoring Plan* has been developed and is included as Attachment 12 of the *Revised Documentation of Environmental Indicator (EI) Determination, Current Human Exposures Under Control (CA725) for the MacDermid, Inc., Waterbury, CT Facility*, dated February 14, 2005 (February 2005 Revised EI). Specifically, the *Groundwater Monitoring Plan* has been designed to address the following issues:

1. Evaluating hydrogeologic conditions at the Site by providing a more accurate understanding of the seasonal variations in groundwater elevations across the Site, especially how those variations affect groundwater flow direction. Previous investigations have shown groundwater to flow in a south/southeasterly direction towards the Naugatuck River.
2. Monitoring the presence of light non-aqueous phase liquid (LNAPL) in groundwater at the Site. During the August 2004 groundwater sampling event completed at the Site, LNAPL was observed in one on-site piezometer (PZ-4) and one on-site monitoring well (MW-108) at thicknesses of 3.99 feet and 0.67 feet, respectively.
3. Monitoring the presence of volatile organic compounds (VOCs) and Resource Conservation Recovery Act (RCRA) metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) plus copper, nickel, and zinc in groundwater at the Site. VOCs and metals have been identified as constituents of concern due to the presence of these constituents in groundwater at concentrations that exceeded applicable regulatory criteria as defined by the Environmental Protection Agency (EPA) and in the State of Connecticut Remediation Standard Regulations (Section 22a-133k-1 through Section 22a-133k-3) in the Regulations of Connecticut State Agencies (RCSAs).



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Monitoring at the Site includes the collection of groundwater samples, measurement of water-levels, and observation of product presence and thickness on a quarterly basis.

Groundwater samples will be collected from seventeen monitoring wells on a quarterly basis for a period of one year. Associated with each groundwater sampling event will be the collection of water-level measurements from all monitoring wells and piezometers, and monitoring of LNAPL. Advanced notice of each scheduled groundwater monitoring event will be provided to the EPA at least one week prior to the start of each event.

The purpose for completing quarterly groundwater monitoring over a period of one year is to assess seasonal variations and groundwater flow direction, to evaluate the presence of LNAPL in groundwater at the Site, and to characterize groundwater quality. The overall objective of such monitoring is to gather sufficient data to conclude that conditions in groundwater at the Site do not pose an unacceptable risk to human health, as defined in the February 2005 Revised EI.

The primary purpose of the annual groundwater monitoring is to provide a continuing assessment of groundwater quality at the Site and to ensure that either the conditions do not change adversely over time or that any adverse changes that might occur would be detected within a reasonable time-frame. The schedule for such annual sampling will be based on the occurrence of any seasonal variations that are observed during the quarterly monitoring program. Specific analytes included in the annual sampling will be those judged to be of concern based on the results of the quarterly groundwater sampling program, with emphasis on those constituents identified during quarterly sampling and those constituents previously detected and identified as exhibiting a potential risk to human health or the environment at or in the vicinity of the Site. Prior to initiating annual groundwater monitoring, a plan for the annual groundwater monitoring program will be developed and submitted to the EPA for approval.

2. *The facility has determined that the exposure pathway for on-site indoor workers to contaminated indoor air is complete because the manufacturing activities have ceased, and the facility is unoccupied. The facility has previously asked to clarify information that was provided in previous reports that indicated some shipping and receiving activity occurring at the East Aurora Street Building. While the cover letter indicates on Page 8 that the EI documentation has been revised to state that "operations at the facility have ceased, the buildings are unoccupied, and that routine inspection of short duration will be the extent of worker activity at Site, "Page 4 of the EI still indicates that there is shipping and receiving activity at the facility. Please rectify this apparent discrepancy.*

Page 4 of the text in the February 2005 Revised EI will be edited to accurately state that "operations at the facility have ceased, the buildings are unoccupied, and that routine inspection of short duration will be the extent of worker activity at Site".



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SPECIFIC COMMENTS

Report Cover Title

3. *The title on the cover of the report is given as "Documentation of Environmental Indicator Determination (CA750), Current Human Exposures Under Control" However, the Human Exposure Environmental Indicator uses the RCRIS code CA725, not CA750. Please revise the title of the report to correct this typo.*

The title on the cover of the February 2005 Revised EI has been revised to accurately state the RCRIS code of CA725.

Question 2

4. *Several discrepancies exist between the EI text and Figure 2 in Attachment 1. The list of on-site receptors, exposure pathways, and media on Page 4 of the EI includes exposure of environmental samplers to soil and groundwater via ingestion and dermal contact. However, Figure 2 in Attachment 2 shows dermal contact, and not ingestion, as the only pathway for environmental sampler exposure to groundwater. Revise the text or the figure to address this discrepancy. Also, light non-aqueous phase liquid (NAPL) was found in well PZ-4 and MW-108 during the most recent sampling event. Environmental samplers may be exposed to NAPL during routine sampling. Include exposure of environmental samplers to NAPL via dermal contact in the text and Figure 2.*

Figure 2 has been revised in the February 2005 Revised EI to illustrate dermal contact and ingestion as a potential exposure pathway for environmental samplers. The text and Figure 2 in the February 2005 Revised EI have been revised to include exposure of environmental samplers to NAPL via dermal contact.

In addition, several industrial facilities are reportedly located downgradient of the site. However, indoor workers have not been included in the list of off-site receptors on Page 5, or Figure 2. Although the potential exposure may eventually be determined to be insignificant, all potential receptors should be considered in the conceptual site model. Revise the text and Figure 2 to include indoor workers as potential off-site receptors.

The text and Figure 2 has been revised in the February 2005 Revised EI to illustrate indoor air inhalation as a potential exposure pathway for off-site indoor workers at downgradient industrial facilities.

Furthermore, it is unclear whether the arrows on Figure 2 represent complete exposure pathways, or potentially significant exposures. If the arrows represent complete pathways, include recreator exposure to surface water and fish consumption, as it was determined in the EI that exposure to the Naugatuck River and consumption of fish from the river are complete pathways (Question 3, Page 19). Also, the text on Page 5 states that dermal contact with water in Steel Brook, and ingestion of fish from Steel Brook is a potential pathway. However, the EI text later states (Page 19) that this is an incomplete pathway. Clarify the meaning of the arrows, and revise the text and figure as necessary.



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Figure 2 has been revised in the February 2005 Revised EI to show that the exposure pathways are potential. No revision was required for the text.

Trespassers are included in Figure 2 as potential receptors, but are not included in the text on Page 4. Also, there is not potential pathway indicated for trespassers. Revise the text to clarify that no potential exposure pathway exists for trespassers since the surface soil contamination was not detected above screening levels.

Figure 2 has been revised in the February 2005 Revised EI to illustrate that dermal contact and ingestion is a potential exposure pathway for trespassers. The text has been revised in the February 2005 Revised EI to state that the potential exposure pathway of dermal contact and ingestion to trespassers through the surface soil medium has been eliminated since the surface soil contamination was not detected above screening levels.

5. *Calculation of the alternative surface water protection criteria (SWPC) for the site is a multi-step process. Please include a calculation section with the calculations written out, in addition to the text, for clarity.*

An alternative SWPC criterion was calculated for PCE in accordance with the methodology described in the RSRs using the human health criterion for "organisms only", as tabulated in Appendix D of the State of Connecticut Water Quality Standards. For PCE, the human health criterion for "organisms only" is 8.85 micrograms per liter ($\mu\text{g/l}$). According to the RSRs, an alternative, site-specific SWPC may be calculated for a site in order to determine whether groundwater discharging from a specific site has the potential to affect water quality in the surface water body to which such groundwater discharges. In this case, groundwater flowing beneath the Site discharges to the Naugatuck River, located approximately 1,000 feet southeast of the Site. Calculations to determine an alternative SWPC were performed in accordance with the methodology provided in Section 22a-133k-3 (b)(3)(A) of the RSRs. The 7Q10 for the Naugatuck River was obtained from the report entitled, *Total Maximum Daily Load Analysis for the Upper Naugatuck River, Thomaston, CT*, prepared by the Connecticut Department of Environmental Protection. The value of 12.6 cubic feet per second given in that report for the 7Q10 of the Naugatuck River at Thomaston, Connecticut, was actually a very conservative value in terms of the actual 7Q10 for the Naugatuck River in the vicinity of the MacDermid facility, since Thomaston is located a considerable distance upstream of Waterbury. Therefore, if the concentrations at the site are below the conservatively calculated alternative SWPC, there can be a high level of assurance that the groundwater discharging from the Site to the Naugatuck River will not result in a condition that would pose a risk to human health.

To further increase the conservative nature of the assessment of the potential risk associated with groundwater discharging from the Site to the Naugatuck River, the plume of groundwater exiting the Site exhibiting contamination due to the PCE was estimated conservatively to exhibit a width of approximately 970 feet along the southeastern property boundary. The more likely width of the plume for which elevated PCE concentrations (concentrations in excess of the tabulated SWPC identified in the RSRs) are believed to be present is closer to 280 feet.

According to *The Bedrock Geology of the Waterbury Quadrangle* published in 1967 by the State Geological and Natural History Survey of Connecticut and the depths at which refusal was reached at



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locations on the Site where deep monitoring wells were installed, the approximate depth to bedrock beneath the Site is 60 feet below grade. This was conservatively established as the lower bound of the plume of groundwater exiting the Site at a concentration of 280 $\mu\text{g/l}$. As the depth to groundwater below the Site is approximately 30 feet, an estimated saturated thickness of contamination in groundwater below the site is 30 feet.

The volume of the plume discharging to the Naugatuck River (Q_{plume}) was calculated using the following data: the plume of groundwater exiting the Site exhibiting contamination due to the PCE was estimated conservatively to exhibit a width of approximately 970 feet along the southeastern property boundary multiplied by the an estimated thickness of contamination in groundwater below the site of 30 feet (i.e. depth), which resulted in an area (A) over with the plume discharges to the river of 29,100 square feet.

The groundwater discharge to the Naugatuck River (Q_{plume}) was calculated conservatively using the area of the plume multiplied by an average hydraulic conductivity (K) of 56 feet per day, which was determined based upon the nature of the unconsolidated materials in the saturated zone and by the average horizontal hydraulic gradient, which was calculated using the groundwater contours from the August 2004 groundwater sampling event to be 0.004 feet/foot. The groundwater discharge from the plume to the river was thus calculated to be 6.52×10^3 cubic feet/day based on the following calculation:

$$Q_{\text{plume}} = K * i * A$$

where:

Q_{plume} = groundwater discharge from the plume to the Naugatuck River
K = average hydraulic conductivity
i = average horizontal hydraulic gradient
A = area of plume

To calculate a dilution factor (DF) in accordance with the RSRs, a conservative value for 25% of the 7Q10 to the Naugatuck River was calculated to be 2.72×10^5 cubic feet/day. As described in the RSRs, a dilution factor was calculated using the following calculation:

$$DF = (25\% * 7Q10) / Q_{\text{plume}}$$

where:

Q_{plume} = volume of plume discharging to the river = 6.52×10^3 cubic feet/day
 $25\% * 7Q10$ = 2.72×10^5 cubic feet/day

This calculation resulted in a dilution factor of 41.7, which is, again, a very conservative value for this Site, particularly because the value for the 7Q10 used in the calculation was developed for a location far upstream of the Site. The actual 7Q10 of the Naugatuck River in the vicinity of the Site would be far greater.

To calculate an alternative SWPC for the Site, the human health criterion for "organisms only" of 8.85 $\mu\text{g/l}$ was multiplied by the calculated dilution factor of 41.7, resulting in a very conservative estimate for an alternative SWPC for PCE discharging from the Site of 369 $\mu\text{g/l}$. Consequently, the PCE



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concentration of 280 $\mu\text{g/l}$ that was detected in groundwater from monitoring well MW-115 is less than the very conservatively calculated alternative SWPC of 369 $\mu\text{g/l}$. Based on this calculation, groundwater discharging from the Site does not pose a risk to human health via a surface water pathway. The human health criterion was used for the calculation of a alternative dilution factor because it is the criterion that was used in the calculation of the original SWPC and the water in the Naugatuck River in the vicinity of the Site would not be used for direct consumption.

Attachment 2, Drawing 3

6. *Water levels were collected at all functioning existing wells and newly installed wells and piezometers in August 2004. Groundwater elevations should be included for all these wells and piezometers on Drawing 3 – Groundwater Contour Map. Revise the drawing to include groundwater elevations for PZ-1 and PZ-2, and revise the contours if necessary.*

Drawing 3 in Attachment 2 of the February 2005 Revised EI has been revised to depict the groundwater elevations (August 2004) for piezometers PZ-01 and PZ-02.

Attachment 2, Drawing 4

7. *Please provide an additional table, containing all soil sampling data, along with the appropriate comparison criteria, in addition to the summary table on Drawing 4.*

Due to the amount of data, and limited space available on Drawing 4, new tables have been developed and included as Attachment 12 of the February 2005 Revised EI. For purposes of evaluating potential exposures to contaminated soil at the Site, the applicable criteria used as screening levels for assessing constituent contaminants in soil were based on the Residential Direct Exposure Criteria (RDEC) provided in the RSRs. A summary of soil sampling and analytical information is included in Table 5. Table 6 provides a summary of the soil analytical results, and Table 7 provides a summary of constituents detected in soil. As there were no exceedances of contaminant constituents in soil at concentrations greater than the RDEC, a table providing both the numeric RDEC and soil sampling data, for comparison purposes, is not available. However, for reference purposes, select sections of the RSR text have been incorporated into Attachment 12 which document the numeric, tabulated RDEC.

Attachment 6, Tables 3a and 3b

8. *The text of the EI documentation discusses detected VOC concentrations in relation to Connecticut's Proposed Ground Water Volatilization Criteria (VC), issued in March 2003. It is indicated through the text that VOC concentrations do not exceed the Proposed VC during the most recent sampling event. However, Tables 3a and 3b compare groundwater data, both historical and current, to the 1996 RSR VC. Data collected after March 2003 should be compared to the Proposed VC. This would include the September 2003 and August 2004 groundwater data. Revise the table to include columns for both the 1996 RSR and the 2003 Proposed VC, and compare the data to the appropriate VC.*

Based on a comparison to the Proposed VC, Table 3a should be revised to show exceedances of the Proposed Residential VC for 1,2-dichloroethane (6.5 $\mu\text{g/l}$) at MW-115 in August 2004 (12 $\mu\text{g/l}$). Exceedances of the Proposed Residential VC for 1,1-dichloroethylene (190 $\mu\text{g/l}$) should be removed for MW-115 for September 2003 (72 $\mu\text{g/l}$) and August 2004 (60 $\mu\text{g/l}$).



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In Table 3b, the exceedances shown for MW-115 for September 2003 and August 2004 should be removed from the table, as they do not exceed the Proposed Industrial/Commercial VC of 920 µg/l.

The tables will be revised. All groundwater data will be compared to the current (i.e., 1996) residential and industrial VC and provided in Tables 3a and 3b as shown in the revised *Documentation of Environmental Indicator (EI) Determination, Current Human Exposures Under Control for the MacDermid, Inc. Waterbury, CT Facility*, prepared by LEA and dated August 2004. Table 3c will be developed to tabulate exceedances of VOCs in groundwater collected in 2003 and 2004 to the proposed residential VC. There are no exceedances of VOC concentrations in groundwater collected in 2003 and 2004 for the proposed industrial/commercial VC. Tables 3a, 3b and 3c will be provided in Attachment 6 of the February 2005 Revised EI.

Attachment 6, Table 5

9. *Table 5, which, according to Page 13 of the EI, provides constituent concentrations that exceed the SWPC, is missing. Please provide this table.*

A typographical error was made in the text of the revised *Documentation of Environmental Indicator (EI) Determination, Current Human Exposures Under Control for the MacDermid, Inc. Waterbury, CT. Facility*, prepared by LEA and dated August 2004. Table 5 in that text should have actually been stated as Table 4. This error will be corrected in the February 2005 Revised EI. Furthermore, Table 4 (formerly Table 5) will be provided in Attachment 6 of the February 2005 Revised EI.

Exhibit C

Field, boring and well logs

10. *On page 2-2 of the work plan it is noted that elevations were to be based on an arbitrary datum at the site. This is repeated on Drawing 3 - GW Contour Map. However, it is not clear what point was actually used as a datum. This information should be provided.*

Elevations provided were referenced to an arbitrary datum that was established for the Site of 1,000 feet. Location of the arbitrary datum reference point is now shown on Drawing 3 – Groundwater Contour Map.

Due to inconsistencies in the depth to the bottom of the well measurements, it appears as though the measurements are not being taken from a consistent point of reference. In the future, ensure a consistent point of reference is used (e.g., place a mark on the casing edge where the measurement will be taken from each time).

Commonly, silt accumulates at the bottom of a well which may result in measurements of the depth to the bottom of a well that varies over time. As such, it is the opinion of LEA that there are no inconsistencies in depth-to-bottom measurements. Furthermore, LEA's SOP entitled, *Low Flow (Low Stress) Liquid Sample Collection and Field Analysis*, establishes a method that is already in place to ensure consistent measurements. This SOP is provided in Attachment 5 of the February 2005 Revised EI.



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11. *Based on the Work Plan, it appears as though two deep wells were to be installed at the same depth as 116D. However, for 117D refusal was apparently reached at 55 feet, instead of 60, so the well was screened from 45-55 feet.*

One major discrepancy for MW-117D requires clarification. Based on the Daily Field Reports, MW-117D had to be drilled at least twice. The first time, 7/2, refusal was reached at 33 feet. Drilling again on 8/6, refusal was reached at 55 feet, and the well was installed. Then on 8/11, the 2nd page of the Daily Field Report states "did not complete concrete cap on MW-117D-RW and abandonment of MW-117D." Based on this information, it appears as though the well required a 3rd drilling, but this is not clear. In the section with the Field Report from 8/11, the 2nd page called "Field Sampling Record" indicates that MW-117D has a depth of 39.9 feet. In the same section, there is a Well Completion Report indicating a depth of 55 feet and a well screen at 45-55 feet. In addition, the depth-to-bottom measurements from 8/12 and 8/16 are between 52 and 55 feet. The Daily Field Report from 8/12 (page 2) states that the "screen from MW-117D (old) became detached inside of the hole." This may have been the reason the well had to be drilled a third time. Please clarify this information.

On July 2, 2004, LEA's 6610 GeoProbe® was used to advance a soil boring that was to be used to install monitoring well MW-117D. During advancement, refusal was met at 33.5 feet. Due to difficult subsurface conditions, it was determined that the soil boring location would be abandoned, and a new, slightly off-set soil boring, would be advanced using additional auger attachments to the 6610 GeoProbe®. On July 20, 2004, the 6610 GeoProbe® was used with associated additional auger attachments to advance a new soil boring, off-set slightly from the original location of July 2, 2004. The determination was made that instead of installing monitoring well MW-117D, monitoring well MW-117S would be installed in this soil boring location. While attempting to advance the soil boring for the installation of monitoring well MW-118D on July 21, 2004, using the 6610 GeoProbe®, it was determined that due to difficult subsurface geologic conditions, the use of a hollow-stem auger drilling rig would need to be used to advance the borings for this well and for well MW-117D.

On August 5, 2004, monitoring well MW-117D was installed, using a hollow-stem auger drilling rig, with a well screen interval from 45 to 55 feet below ground surface. Bedrock was encountered at approximately 55 feet below ground surface. Due to the presence of bedrock, the well screen interval could not be placed as originally proposed in the report entitled, *Additional Investigations Work Plan and Quality Assurance Project Plan for Documentation of Environmental Indicator (EI) Determination, Current Human Exposures Under Control for the MacDermid, Incorporated, Waterbury, CT* (Work Plan), prepared by LEA and dated June 24, 2004. During initiation of development of monitoring well MW-117D on August 11, 2004, the bottom of the monitoring well was measured at 40 feet. Development was attempted, during which time sand and bentonite chips/grout were observed in the development water. Due to the significance of the location of this monitoring well, it was determined that the well material would be removed and a new monitoring well installed at the same location, which is identified as the currently existing monitoring well MW-117D.

Although the field paperwork may have stated MW-117D-RW, which was designated to indicate that the original monitoring well MW-117D was replaced in the exact same location with a new monitoring well due to poor well construction techniques, there is only one monitoring well identified as MW-117D.



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11. *Another point that should be clarified is in regards to MW-117S. The Daily Field Report from 8/7 states that the "original MW-117S" was removed and "MW-117S-RW" was installed. According to the notes, the original well material was removed and the same borehole was used to install the new well. There is no record provided of installation of the "original MW-117S" so it is unclear why replacement was necessary. The new well screen was reportedly set at 28-38 feet. Then, on 8/12 (page 2), there are notes stating that the drillers arrived to finish "abandoned old MW-117S." There is no explanation provided for why abandonment would be required if the same borehole was reused (although the handwriting is difficult to read, and it may not say "abandoned"). Please provide clarification.*

As noted above, on July 20, 2004, monitoring well MW-117S was installed in the soil boring location originally designated for monitoring well MW-117D, to a depth of 35 feet. However, the Work Plan (LEA, 2004) indicated that the anticipated screened interval for monitoring well MW-117S was intended to be from 28 to 38 feet below ground surface. As such, the original monitoring well MW-117S was removed and a new monitoring well MW-117S was installed with the appropriate screened interval. For field documentation purposes, the re-installed monitoring well MW-117S was identified as MW-117S-RW. Although the field paperwork may have used the wording "MW-117S-RW" for purposes of clarity, there is only one monitoring well identified as RH-MW-117.

There is no additional discussion in the Work Plan or Technical Memorandum report that provides any information on MW-117S, MW-117S-RW, MW-117D-RW, or the abandonment of MW-117D. Additional information should be provided in the Technical Memorandum on any problems encountered in the field, and an accurate depth to all well bottoms should be provided.

This has been addressed above.

13. *In the Field Report for 8/5 (page 2 of 5), the notes state that during drilling of PZ-02, refusal was reached at 11 feet. It is noted that it could have been a cobble, boulder or sewer pipe, and it was drilled through. This could be a possible issue if it was a sewer pipe, and if the sewer is active. Please provide additional information regarding refusal at this location.*

The information documented on page 2 of 5 for the Field Report, dated August 5, 2004 with regards to possible presence of a sewer pipe at 11 feet below grade is a speculation, and not factual. Due to the nature of the geology at the Site, and as shown in other Field Documents, subsurface conditions are extremely difficult to penetrate during drilling. The geology at the Site includes the presence of heterogeneous glacial outwash material, which includes sub-rounded cobbles. It is most likely that a large cobble was encountered during the advancement of piezometer PZ-02 which accounted for refusal, and not a sewer pipe, especially at a depth of 11 feet below grade.